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ARS 42-51  
March 1961

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Service

MECHANICAL VIBRATORY FEEDER FOR SMALL SEEDS<sup>1/</sup>

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Vibratory feeders are increasing in popularity as metering and conveying devices for granular materials in many industries. In the seed industry, they are used for feeding seed into processing machines, for accurately metering seed to the sacking scales, and for proportioning and blending seed. They are rapidly becoming standard equipment in laboratories concerned with seed cleaning research and seed analysis.

Commercial electric vibrators rated at 1/4 ton per hour are being used very successfully in the cooperative seed processing research of the Agricultural Research Service, U. S. Department of Agriculture, and the Oregon Agricultural Experiment Station. Many of these units could be used to advantage in laboratory research, but they are relatively expensive--often costing more than the small processing models they feed. As a result, agricultural engineers investigated other means of feeding the research machines. This resulted in the development of an inexpensive, motor-driven mechanical vibrator feeder (fig. 1), that gives satisfactory performance; one that can be constructed in local machine shops.

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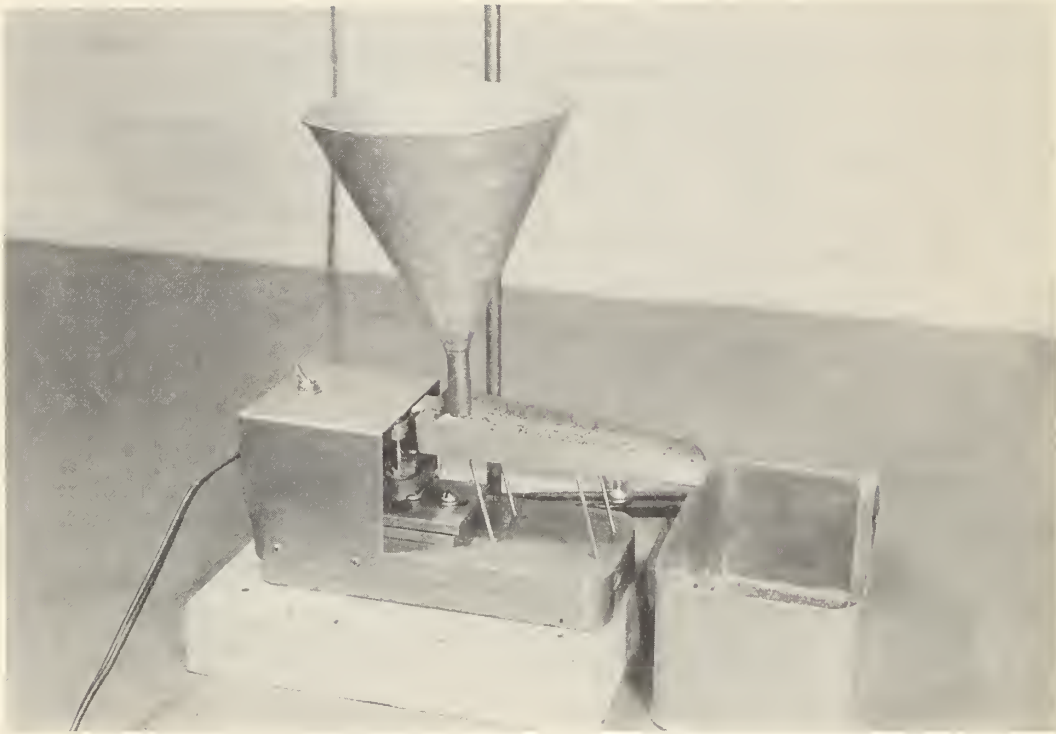


Figure 1. Vibrator Feeder.

The newly developed feeder consists of a cam with 1/8" throw mounted on a fractional horsepower shaded-pole electric motor (100 volt, 60 cycle, 2,400 r.p.m.), small rectangular pan (one end open) mounted on spring wire supports, a movable base, a stationary base, a compression spring, a knobbed control screw, and an electrical "on - off" switch. Construction drawings of this feeder are given in figures 2 and 3.

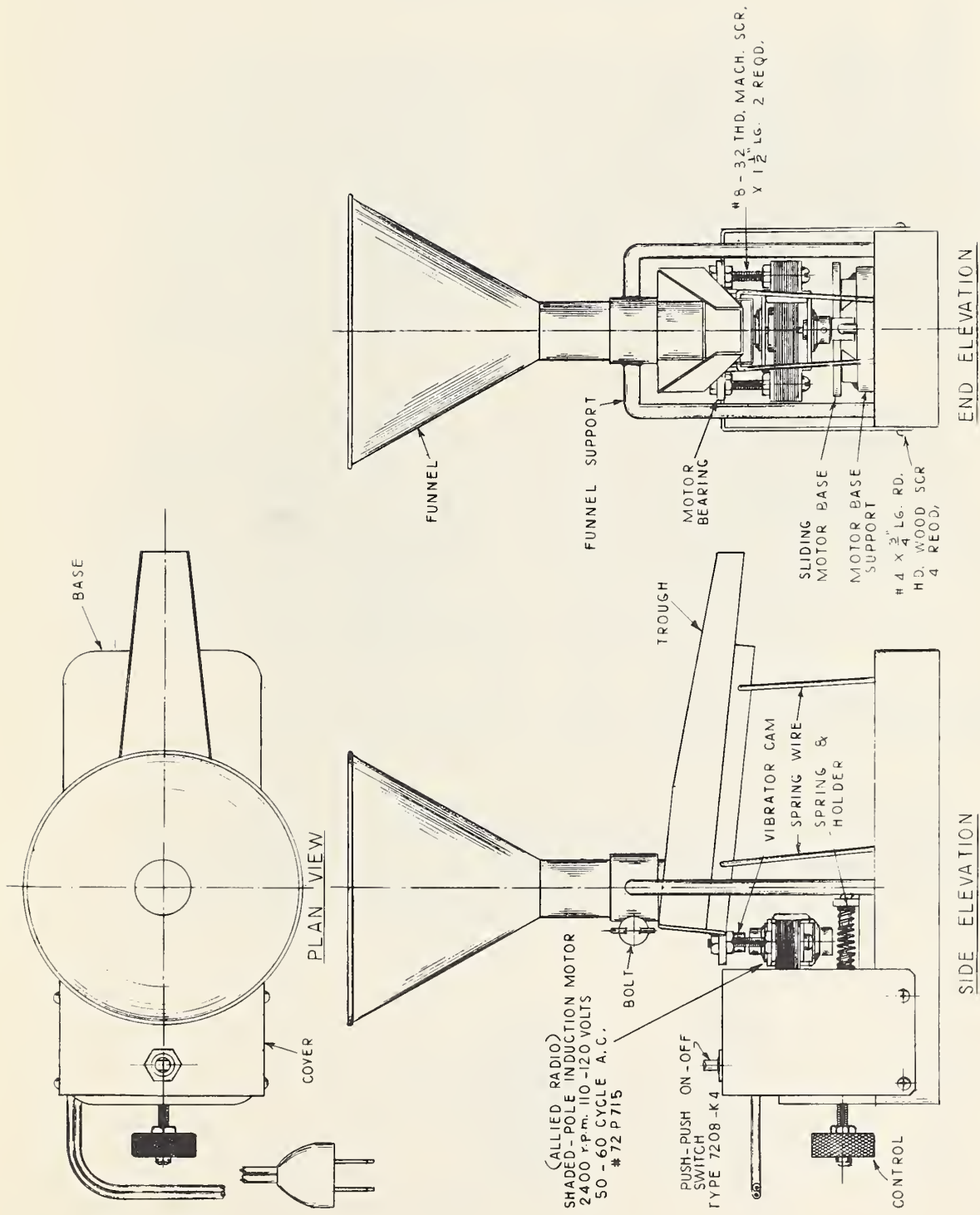


Figure 2.





## HOW THE FEEDER OPERATES

Seeds are placed in the supply hopper and the electrical switch moved to the "on" position. With the motor running, the control knob is adjusted to move the sliding base toward the spring-supported feed trough, compressing the coil spring. The control screw is tightened until the motor-driven cam comes in contact with the feed trough (pan), moving it laterally and flexing its springs. This causes the trough to rise slightly on the forward movement and drop on the return travel as the spring unflexes. Seed in the trough is thrown into the air on the upward stroke and lands slightly forward from its previous position; thus gradually working its way to the discharge end of the feeder trough.

The intensity of the vibration and the rate of material flow can be regulated by the control knob and the action is proportional to the contact arc between the motor-driven cam and the spring-supported trough. When the contact arc is only a few degrees, the trough displacement is small and the movement of the seed is at a minimum. However, the trough movement and seed flow increases as the contact arc is lengthened. The machine will give a constant feed at a desired rate, ranging from a trickle to a rapid flow as high as 1/4 ton of alfalfa seed per hour.

Several feeders constructed in the research shop have been in the laboratory for 6 months where they receive frequent use. They gave excellent service and show no apparent wear.

Feeders of larger sizes and capacities can be shop-constructed at only a fraction of the cost of present vibratory machines, and their uses are limited only to one's imagination, regardless of the type of granular material to be handled or the industry where they may be used.



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